

genus *Dichobune* are also considered by Gervais to be more properly *Xiphodons*; so it is perfectly clear that a more careful comparison than has yet been made will be necessary to determine the claims of either to generic distinction.

Being always strongly opposed to the multiplication of generic designations without very adequate grounds, I shall be content in the present instance, to retain the Cuvierian name *Xiphodon**, and, in the absence of any certain evidence that it belongs to any of the previously described species, to distinguish it as *X. platyceps*.

It may be added that all the species with which it is most nearly related, found both in England and France, belong to the Upper Eocene epoch, or "proocene" of Gervais.

The principal dimensions of the cranium are as follows:—

	inches.	centin.
Length, in its mutilated state	8·2	20·8
(About 9 inches if perfect.)		
From anterior margin of orbit to occipital crest	5·3	13·5
From anterior margin of orbit to infraorbital foramen	1·5	3·8
Breadth of upper surface of skull between orbits	2·8	7·2
Greatest parietal breadth	2·4	6·1
Breadth at anterior part of temporal fossa	1·8	4·6
Height of skull (between frontal region and hinder part of palate)	2·6	6·6
Height of orbit	1·3	3·3
Length of molar and premolar series	3·7	9·5
Breadth of palate between posterior molars	9	2·3
„ „ between middle premolars	1·1	2·8

2. On a New Ziphioid Whale. By JULIUS VON HAAST, Ph.D., F.R.S., Director of the Canterbury Museum, Christchurch, New Zealand. Communicated by Prof. W. H. FLOWER, F.R.S.

[Received November 16, 1875.]

In the month of May of this year the Canterbury Museum received from W. Hood, Esq., of the Chatham Islands, three skulls of Ziphioid Whales taken from specimens stranded with about 25 others during the summer of last year on the Waitangi beach of the main island of that group.

They were described as "blackfish," all belonging to the same school, by my informant, who moreover believes that the whole series belonged to the same species.

* Not, however, as a subgenus of *Anoplotherium*, from which it is perfectly distinct.

Unfortunately the skulls were so badly separated from the body that the occipital portion has been cut off, so as to lay the brain-cavity open; but as they were brought over with the greater portion of the skin still attached, some hitherto unknown and, as I think, peculiar characteristic features in the dentition of a Ziphioid genus have fortunately been preserved.

These three skulls accord in many respects with the genus *Mesoplodon* of Gervais, of which I will point out only one, viz. that they possess one tooth in each ramus of the lower jaw opposite the posterior edge of the symphysis, and of varying size and shape, either hidden below the gum or rising conspicuously above, according to age and sex. They differ, however, from all known species of the genus by possessing in the upper jaw, starting in a vertical line above the posterior border of the mandibular tooth, a series of small conical teeth slightly incurved, which extends to near the gape of the mouth.

I may here at once observe that these teeth are neither rudimentary nor are they confined to young animals, because, as I shall show in the sequel, these three skulls are derived from individuals of different ages, of which one is an aged (male?) animal, in which the row of teeth is best developed. It is thus evident that this series of teeth is a functional portion of the animal, and is constant and necessary for its proper nourishment, some of them being broken off, others evidently worn down from use. That these small teeth, of which the largest stands scarcely half an inch above the gums, are only rooted in the gums, does not lessen their value as a specific character of some importance.

Of the species of Ziphioid Whales inhabiting the New-Zealand seas I have obtained three, namely *Berardius arnouxii* (3 specimens), *Ziphius novæ zealandiæ*, and *Mesoplodon floweri* (Haast, MS.), none of which shows the least sign or rudiments of teeth in the upper jaw. Moreover several others have been secured in New Zealand and Australia; but nowhere can I find that, except the teeth in the lower jaw, they possessed any; and I have looked carefully over all the different papers on the Ziphioid Whales of the northern hemisphere to which I had access, without finding the slightest mention made of the occurrence of such a peculiar feature in their dentition.

On the contrary, Professor Flower in his excellent paper on the recent Ziphioid Whales (Trans. Zool. Soc. vol. viii. part 3), when enumerating their principal structural characters, begins by stating that they have "no functional teeth in the upper jaw." I believe that this term functional is rather ambiguous and can scarcely be applied to the genus under consideration, as we are totally unacquainted with the food on which it subsists, or the manner in which the same is obtained.

It is true, these teeth do not grow from alveolar grooves in the maxillaries, but only from a groove in the gums, and have their roots implanted therein; nevertheless I have no doubt that they are always present and do perform as distinct and important functions as those of *Kogia* or any of the Dolphins which possess teeth of similar form.

The first of the accompanying photographs shows the three skulls in comparison with each other; the second the middle portion of the second skull, belonging to an aged (male?) individual; whilst the following list gives the principal dimensions of these three skulls with the soft parts attached, as far as they could be ascertained; but as soon as they are macerated I shall offer some further observations on their anatomical structure.

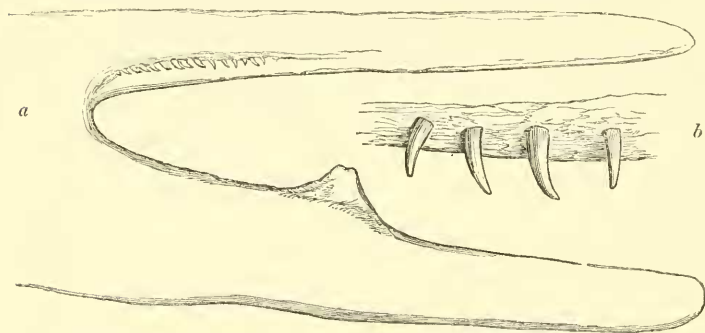
*Table of Measurements of three Skulls of Mesoplodon Grayi,
with the greater portion of soft parts adhering.*

	Skull I., probably female (full- grown).	Skull II., probably male (aged).	Skull III., probably male (young).
	ft. in.	ft. in.	ft. in.
Height of Skull from top of nasals (skin preserved) to lower border of pterygoids, the latter lying exposed...	0 11-13	0 11-38	0 9-12
Greatest breadth of skull across post- orbital processes of frontals.....	1 0-48	1 0-88	9-51
Length of skull from crest of nasal bones to anterior border of rostrum, in a straight line	2 5-46	2 3-47	1 5-07
Length of ramus of lower jaw, soft parts preserved on anterior border	2 7-52	2 6-03	1 7-75
From gape* of mouth to anterior bor- der of lower jaw	1 6-50	1 4-87	10-05
From anterior border of lower jaw to centre of tooth	10-75	10-12	5-00
From centre of tooth to gape of mouth.	7-75	6-75	5-05
Breadth of lower jaw at centre of tooth	2-31	2-69	1-75
Distance from extremity of rostrum to first anterior tooth	11-06	10-75	5-62
Distance from gape to end of teeth ...	1-02	1-37	1-40
Eye, perpendicular diameter, about ...	2-25	2-27	
Opening of blower, the two extremities slightly directed backwards, about...	4-50	4-50	3-25
Number of teeth in upper jaw	19	17	17

I should have liked to give also in this list the breadth of the rostrum at the anteorbital notches, as it would have supplied another important point for comparison; but the coverings prevented this; also I was not able to give the total length of each skull, owing to the occipital portion being cut off; but the length of the skulls from crest of nasals to anterior border of the rostrum, as well as the length of the ramus of each mandible, will supply this deficiency and offer us sufficient material for comparison.

* The drying of the skin has been so unequal in the different specimens, and even on the two sides of the same skull, that the position of the gape cannot be fixed with precision.

Examining the skulls separately, we find that the one marked No. 1 is longer but narrower than No. 2. This is still more striking when we compare the two rostrums with each other, that of skull No. 1 being considerably narrower than that of skull No. 2. The same observation applies to the mandibles, which in No. 1 only widen very gradually and are much narrower all along than those of skull No. 2. In fact, if both skulls had been obtained separately I believe that they would probably have been assigned to two distinct species.



- a.* Side view of upper and lower jaws, covered with the dried skin, of No. 2 (aged male?), showing the row of small teeth above and the single large mandibular tooth. From a photograph.
b. Four of the upper teeth, with the whole of their roots exposed; natural size.

When the skull No. 1 was first examined by me, the sharp point of a tooth in each ramus of the lower jaw, when passing the finger over the gums, was discernible; but I doubt if this was to be felt before the gums were dried up.

In cutting a portion of the gums away, the apex of a very flat tooth, rather acutely triangular as far as visible, was exposed, which stands about one eighth of an inch above the upper surface of the ramus. This tooth is imbedded in a very narrow alveolar cavity situated near the posterior edge of the symphysis, the ramus here scarcely bulging out; this is still more obvious if we compare that portion of the ramus with that of skulls Nos. 2 & 3.

Above the posterior edge of the small tooth in the lower jaw, and which without doubt has to perform some function, notwithstanding that it is covered by the gum, a row of small conical teeth, the apices slightly incurved, begins on each side of the upper jaw, reaching within an inch of the gape of the mouth, which, however, may have somewhat retreated by the drying of the skin.

These small teeth are situated in a well-defined dental groove in the gums. There were 19 teeth on each side, of which, however, several are broken off. They are from 0.20 to 0.40 inch long, and occupied a line 6.12 inches in length, standing nearly the eighth of an inch apart. Of the whole series, the first or anterior tooth is the smallest, the succeeding ones gradually getting larger till the eighth, and then maintaining the same size to nearly their termination.

The crowns of the teeth stand at about the same level with the central line of the palate. The opening along the upper surface of the rostrum is still unclosed, thus showing that the animal is not so aged as the next specimen, No. 2.

I may here add that the rostrum in all three skulls is half an inch shorter than the mandible, and that it lies in a well-defined groove in the latter.

Skull No. 2.—The measurements of this skull, as far as I was able to obtain them, show that, as previously stated, it was not so elongate as the former, but somewhat broader and more massive in all its proportions. The rami of the mandible widen much sooner than those of the former; about 7 inches from their anterior extremity they expand considerably in order to form the alveolar cavity for a large tooth which here rises conspicuously on both sides, having a vertical position. This tooth has a compressed triangular shape, is $2\frac{1}{2}$ inches broad at its base on the line of the gums, and rises $1\frac{3}{4}$ inch above them.

On the inner side near the top it is slightly abraded, and on the outside broken considerably, so as to suggest that the animal used it for the purpose of defence or attack. This injury has taken place on both teeth, so that they have lost their point and show a ragged horizontal apex with a width of nearly a quarter of an inch.

From behind the tooth the rami expand very little as far as the gape.

A similar row of small teeth, described as occurring in the first specimen, exists also in this second skull; but there are apparently only 17 of them. Their position is exactly the same as in the foregoing, the first standing exactly above the posterior edge of the base of the large tooth in the lower jaw.

The teeth have the same form as those previously described, except that they are generally thicker; this becomes conspicuous with the 7th tooth, after which they gradually increase to the 13th, which is $\frac{1}{8}$ of an inch thick at its base and stands 0.45 inch above the gums. They then keep nearly the same size to the posterior end of the series.

As the space on which these 17 teeth stand is only 4.25 inches long, besides their greater stoutness they are far more crowded than in the first-described skull.

Owing to the fact that the gums have dried more thoroughly in this than in the two other skulls, in both of which the teeth stand erect with the curve of the apex directed inwards, the teeth in this skull are no longer in their normal position, but lie somewhat forwards on the palate.

The groove in the upper surface of the rostrum, between the premaxillaries, is filled by a convex ridge of dense bone with a small channel on each side. That this is only caused by age, and that it is neither a sexual nor a specific character, is proved by the fact that the next skull, No. 3, which is doubtless a young half-grown specimen of the same sex as the one under review, has this groove on the top of the rostrum still open, and thus resembles the skull No. 1, although in the latter that groove is narrower and more shallow.

Skull No. 3.—Assuming that the last-described skull belongs to

an aged male, the measurements of the third skull under consideration must lead us to the conclusion that it is that of a young half-grown male. Beginning with the lower jaw, the same form as in the foregoing is observable, the rami expanding considerably as soon as we reach the neighbourhood of the alveolar cavity; and although the tooth in the same is only small, and stands only 0.25 inch above the edge of the ramus, that alveolar cavity is much more bulged out and has a different form from the first (or female?) skull described. The apex of the tooth was distinctly visible, and seemed to have already pierced the gums when the animal was alive.

The row of teeth in the upper jaw, however, which have the same form as in the skull No. 2, are smaller and somewhat more slender. They begin likewise above the posterior end of the alveolar cavity.

There are, as in the preceding skull, 17 teeth on each side, occupying a length of 2.48 inches. They stand more closely together than in the supposed female skull No. 1, thus also agreeing with the second skull in that respect.

In volume vi. of the Transactions of the New-Zealand Institute, Dr. Hector describes the lower jaw of a Ziphioid Whale under the title "Notice of a variation in the dentition of *Mesoplodon hectori*, Gray."

It is difficult for me to conceive by what process the tooth in the lower jaw which, in *Mesoplodon hectori*, stands at the anterior end of the ramus, could have travelled as far backwards as to stand now opposite the posterior edge of the symphysis. Hitherto I have believed that the position of the mandibular teeth was constant and a valuable specific character—an opinion which, as far as I am aware, is held by the most eminent cetologists, and which the observations I was able to make on the three skulls under review amply confirms. Moreover I wish to add that a comparison of these three skulls with the skull of *Mesoplodon hectori*, Gray, in the Canterbury Museum, and which is derived from an aged specimen, shows at a glance the distinct specific characters.

We are only at the beginning of the study of our Ziphioid Whales; and I have no doubt that year by year new material will come to hand; so that by the lumping of two distinct species into one, as attempted by Dr. Hector, and for which no tangible reason can be assigned, only confusion will be created.

The occurrence of hidden teeth in the gums of *Ziphius australis*, Burmeister, of which he gives a careful description in his exhaustive paper, "Descripción detallada del *Epidodon australe*" in the 'Anales del Museo público de Buenos Ayres,' part v. page 328, is a point of great interest. On first thought, one might assume that that specimen was so young that the teeth had not yet pierced the gums, and that animals belonging to that species when full-grown would be possessed of a row of teeth in each jaw resembling those of *Mesoplodon grayi*. However, two (and what I think fatal) objections have to be urged against such a theory.

The skull of No. 3 belongs doubtless to a younger specimen than

Ziphius australis; nevertheless the row of teeth standing above the gums was perfectly formed; and, secondly, the specimen of *Ziphius novæ zealandiæ*, of which the Canterbury Museum possesses a complete skeleton, was an aged female and obtained in the flesh, but did not show the least trace of any row of small teeth above the gums.

I have examined carefully the gums of the new species in both jaws, where no teeth were visible, but without the least success, no hidden teeth being in existence anywhere.

Finally I propose to designate this new Cetacean by the specific name of *grayi* in memory of the late Dr. J. E. Gray, to whom New Zealand is so much indebted for his contributions towards the better knowledge of its natural history.

Conclusion.

In summing up the evidence which the three skulls under review present to us, the following points may be accepted as fully established:—

1st. That there exists a Ziphioid Whale in the New-Zealand seas which possesses a mandibular tooth at the posterior edge of the symphysis, either hidden below the gum or standing conspicuously above it, according to age or sex.

2nd. That the skull of one of the sexes (probably the female) is longer but narrower and lower than that of the opposite (probably the male) sex—the latter possessing also a large triangular compressed tooth rising above the gum, which in the other (probably female) sex is much smaller and almost hidden below the gum.

3rd. That both sexes possess permanently in the upper jaw a row of small conical teeth with the apex slightly incurved, which, although only rooted in the gums, have to perform important functions in the nourishing-process of the animal.

3. On some additional Species of Birds from St. Lucia, West Indies. By P. L. SCLATER, M.A., Ph.D., F.R.S., Secretary to the Society.

[Received November 30, 1875.]

(Plate II.)

The Rev. J. E. Semper, of St. Lucia, who has already done so much to make us acquainted with the ornithology of that island, has lately forwarded to me a third collection of birds, which I have now the pleasure of exhibiting. It contains examples of eight species not included in my two former articles on this subject*, and among them two specimens of a very remarkable form, which

* P. Z. S. 1871, p. 263, and 1872, p. 647.